by W. E. Waters & Paul V. Mook

Forest Insect & Disease Conditions in the Northeast —1957

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RALPH W. MARQUIS, DIRECTOR

Foreword

The primary source of material for this annual summary has been the series of reports submitted by many cooperators to the Forest Insect and Disease Laboratories in New Haven for inclusion in the Northeastern Forest Pest Reporter, a publication issued periodically during the summer field season by the Northeastern Forest Experiment Station. These reports by cooperators make up a timely record of events and activities during the field season which might otherwise be less complete or less easily interpreted at this time.

Additional information furnished especially for this annual report is gratefully acknowledged also. A well-deserved thanks is expressed to the men in the field who, by chance or design, served as observers and reporters of the conditions cited here.

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Drought Effects

THE one event of 1957 that most affected the forest insect and disease picture in the Northeast was the severe drought. The drought was most serious in New Jersey and the Delmarva peninsula; eastern Maryland, Pennsylvania, and New York; and central and southern New England. Its duration was generally from mid-May to mid-August. With an area from New York to Philadelphia taken as a center, drought severity decreased going northward and westward from the broad coastal belt.

Drought may intensify or depress the effects and symptoms of insects and diseases. It can affect the organisms directly; it can affect them through the change in vigor and physiological processes of the host plant. The degree of injury to trees is generally intensified by drought, but perplexing exceptions sometimes occur. In 1957, the drought strikingly showed its many-sided nature with forest tree diseases. For example, the wilts, diebacks, and root rots were generally intensified, whereas some foliage diseases whose life cycle was vulnerable to exceptionally dry weather were oftentimes checked and their damage reduced. With the insects, drought effects were variable and, in many cases, unpredictable. For example, the injurious effects of mites, sucking insects such as scales and aphids, leaf skeletonizers and leaf miners, and root-feeding grubs were generally intensified. On the other hand, some defoliators may have been beneficial. By reducing the transpiration surface area of their host trees, they may have compensated for the reduced water intake from soils deficient in moisture.

Effects on host may be both direct and indirect, immediate and delayed. For example, drought may cause considerable mortality to a tree's small, feeding rootlets, thereby greatly weakening the tree. If damage is severe, the tree may die with no help from insects or diseases. Bark beetles that gain entrance into weakened trees survive in great numbers. The trees may succumb to this attack in the same or the following year, and a population upsurge of the bark beetles results. Likewise, many diseases caused by ordinarily weak parasites gain entrance to such drought-weakened trees. Drought- or frost-killed branch tips serve equally well for entrance courts of weak parasites. Their effects may show up at once, gradually gaining momentum with time as do certain dieback complexes. Or the effects may not be noticeable for many years, perhaps not until long after the initiating cause has been forgotten. This probably occurs with many of the root rots.

What will be the effects in 1958? No accurate predictions can be made, but certain possibilities should be kept in mind and watched for. Do not be surprised to see more dead and dying conifers resulting from bark beetle attack, more wood borer damage to hardwoods, or more severe dieback conditions in 1958 than in 1957.

Major Forest Insects

Spruce Budworm

The spruce budworm survey program in Maine was expanded to include a large series of collections for the evaluation of biological control factors as well as for information on the distribution and abundance of the budworm. This project was carried out by entomologists of the Maine Forest Service with the technical assistance of Station personnel. Collections were made at three stages of budworm development: early larvae (bud-mining), late larvae-pupae, and eggs. The foliage samples and insects were brought to three field laboratories for determination and counting of insects, for rearing, and for recording. A line-strip aerial survey was again conducted. It used parallel lines running east-west, 6 and 12 miles apart, from Fort Kent southward to Greenville and Bangor.

Noticeable defoliation mapped by the aerial survey covered a total of 2,289,000 acres in northeastern Maine. Of these, 1,310,000 acres showed light, 707,000 acres medium, and 272,000 acres heavy defoliation. This represents a decrease from 1956 in the overall extent of infestation, but an increase in severity of attack in certain sectors. In general, the budworm populations declined in the peripheral lightly infested areas and increased in the areas already seriously infested. The biological control studies indicated that parasites were keeping the numbers down in the general area of light infestation, but that aggregate percentage parasitism was at an insignificant level where higher budworm populations predominated. The egg-mass survey indicated probable continuance of high budworm populations in 1958 in the areas currently under severe attack, with the expectation of heavy defoliation and some top-killing of balsam fir. A careful consideration of these factors by State and Federal entomologists has resulted in a recommendation for airplane spraying of approximately 300,000 acres in northeastern Arostook County in June 1958.

An insect identified as the spruce budworm, Choristoneura fumiferana (Clem.), by an expert at the U.S. Na-

tional Museum was found feeding on the staminate flowers of Virginia pines at Blair and Bedford, Pa. This is a very interesting find.

Pine
Sawflies

An extensive aerial survey by Forest Service personnel in eastern Maryland revealed both an intensification and a spread of the infestation on Virginia pine by Neodiprion pratti pratti. The survey covered a total of 1½ million acres. Approximately 14 percent, or 210,000 acres, was in pine type and all of this area showed evidence of sawfly feeding. Although no very large area of severe defoliation was recorded, complete stripping and some tree mortality was observed in spots. The lower Patuxent River drainage was seriously infested for the third year, and many trees showed the cumulative effects of the insect attack. An egg survey is being conducted this winter on the Beltsville Experimental Forest to determine the potential infestation and possible need for direct control measures there is 1958.

A closely related sawfly, N. pratti paradoxicus, continued to be abundant in southern New Jersey. Pitch and shortleaf pines were lightly-to-heavily defoliated throughout most of Burlington and Ocean Counties and in adjoining portions of Middlesex, Mercer, Monmouth, Camden, and Atlantic Counties. A ground survey by State personnel of this infestation revealed that trees in a large section of Burlington and Ocean Counties were also under attack by the pine needle miner, Exoteleia pinifoliella. In this area, the sparseness and browning of foliage due to this combined attack were very noticeable.

Infestations of the European pine sawfly, N. sertifer, in red, Scotch, and jack pine plantations in southern New York and southeastern Connecticut are apparently on the increase. This pest, or a near relative, was reported feeding on red and Scotch pines in Monroe and Carbon Counties, Pennsylvania.

The red-pine sawfly, N. nanulus, was present in noticeable numbers in approximately 2,000 acres of red pine plantations in St. Lawrence County, New York. However, the populations were not as high as predicted by an egg survey in 1956, apparently due to an unusually poor egg hatch. The red-headed pine sawfly, N. lecontei, was a serious pest in pine plantations throughout the region. A damaging infestation in a 50-acre red pine planting in Saratoga County, New York, was sprayed with DDT with very satisfactory results. Scattered, smaller infestations in Saratoga County and elsewhere were also treated. The white-pine sawfly, N. pinetum, defoliated a large number of pines in Lewis (Co.) Reforesta-

tion Area 7 in New York; a sawfly, probably this species, attacked a group of white pines at Burrillville, R. I.

White-Pine Weevil

From year to year this perennial pest exhibits little, if any, change in general population density. Once established in a stand of young, natural white pines or in a planting of white pine or other susceptible host tree, the rapidity of build-up and maximum degree of infestation attained is dependent on the complex of environmental factors peculiar to that stand or plantation. No formula for assessing the effects of these factors has yet been devised.

An operational-scale test of airplane spraying for control of the weevil was conducted in New York as a joint undertaking of the Forest Service and the New York Conservation Department. Approximately 1,000 acres were treated with DDT at the rate of 4 pounds in 4 gallons of oil solution per acre. The control obtained was inconsistent and generally unsatisfactory. It was recommended that future tests investigate the operational efficiency of the helicopter and also the effectiveness of insecticides of known high toxicity to the weevil with an extender added to give longer residual effect than that obtained by aerially atomized DDT sprays.

An unusually heavy attack on small acreages of red spruce was reported from the Monongahela National Forest, West Virginia. Native trees, 20 to 40 feet tall, were 25 to 50 percent weeviled. Smaller planted spruces were also attacked. No native white pine occurs near these infestations, but there was clear evidence of previous attacks on older spruce in the vicinity.

Shoot And Tip Moths

These too are continuously destructive pests, which, once established, appear to maintain themselves generally at damaging levels. The European pine shoot moth was again abundant in southern Connecticut and New York, northern New Jersey and Delaware, Pennsylvania, and West Virginia. In West Virginia the infestations were reported as medium to heavy in 12 counties, with the heaviest in the Northern Panhandle. A statewide survey of young red pine plantations in Pennsylvania was conducted in October and November by State personnel. This Station assisted in planning the survey, and is cooperating in the analysis of the data (not yet completed) and in the report of the findings.

The Nantucket pine tip moth caused noticeable damage to young loblolly pine and other host species in Delaware, Maryland, West Virginia, and southern Pennsylvania.

Light infestations of a closely related pine tip moth, Rhyacionia rigidana, were reported in West Virginia and Pennsylvania. Damage to the terminals of Scotch pine by another insect, a twig borer, was observed at a number of localities in eastern Pennsylvania and New York. The insect responsible has been tentatively identified as Eucosma sonomana.

Pine Leaf Aphid

This insect has a dual personality--both bad. Serious infestations were present this year in Maine, Vermont, and New York. The galls on the alternate host, red spruce, were abundant in all areas in the spring. Migration to white pine occurred in mid- to late June. With the exception of eastern Maine, the infestations on pine were much lighter than expected from the prevalence of the galls on spruce. Pineus floccus, a closely related species that similarly affects spruce and white pine, has been unusually abundant for several years in New York and Vermont. It was particularly noticeable this year in those states.

Pine Tortoise Scale

A commonly destructive pest on jack and red pine in the Lake States, this insidious insect is less common in the Northeast. In 1957 epidemic populations were reported on Virginia pine in West Virginia, Maryland, and south-central Pennsylvania. Severe infestations occurred at Beltsville, Md., and Shawnee State Park, Pa. Malathion sprays were applied in these two areas--25 acres at Beltsville were sprayed by airplane on May 11 at the rate of 1 pound in 2 gallons of oil solution per acre, and 20 acres in Shawnee State Park received mist blower applications of a 5-percent emulsion during the week of May 20. Both operations were timed to kill the crawlers; the results were reported very satisfactory. Predators, particularly coccinelids, were very abundant in many of the infestations this year and less injury by the scale is expected in 1958.

Gypsy Moth

"The 1957 cooperative Federal-State gypsy moth eradication program in the Northeast began April 22 and was com-

pleted June 14. A total of 2,902,507 acres were sprayed with 2,484,494 gallons of DDT oil solution in the New York, New Jersey, and Pennsylvania area under Federal contract. The breakdown was as follows: New Jersey 193,140 acres; Pennsylvania 130,015 acres; New York 2,579,362 acres. Spraying under State contracts has been completed on 105,820 acres in Pennsylvania, 200,000 acres in New York, 53,874 acres in Connecticut, 120,000 acres in Massachusetts, 16,300 acres in Rhode Island, 100 acres in Maine, 18,880 acres in Michigan, 20 acres in Vermont and 10 acres in New Hampshire."--U.S. Dept. Agr., Cooperative Economic Insect Report 7 (29): 582.

Fall
Cankerworm

This insect's defoliation on Sugarloaf Mountain, Maryland, extended over 600 acres in 1956; this year it covered more than 1,000 acres. By early May, chestnut oak, the predominant species, was almost completely stripped and other oak species were severely fed upon. Recognized predators and parasites of the cankerworm were extremely abundant in the area, and it is expected that the general population level will decline in 1958. However, the spraying of roadside trees with DDT by mist blower was recommended where scenic values were important.

The scattered infestations observed in eastern Maine in 1956 largely disappeared this year. Approximately 1,000 acres of hardwood growth in Warren, Me., were sprayed with DDT by airplane. Few surviving cankerworms have been found.

Maple Leaf
Cutter

Medium-to-heavy defoliation of sugar maple by this pest occurred at a number of locations in northern New York. It has been a serious menace to sugar orchards in Vermont for 2 years. Here, high populations of adults in the spring of 1957 and early development of the young larvae indicated further damage in infested stands. Plans were made to spray by airplane where necessary, using a 6-percent oil solution of DDT at 2 gallons per acre. These plans were abandoned when the anticipated defoliation did not materialize. Moderate-to-heavy defoliation appeared later at spots in Franklin and Washington Counties, Vermont, but this delayed injury was judged not very damaging to the trees. Scattered small infestations were also reported this year in northwestern Massachusetts.

Variable Oak Leaf
Caterpillar

The extensive infestation by this and associated oak caterpillars in southern New Jersey, Delaware, and eastern Maryland subsided greatly in 1957. Only scattered spots with noticeable defoliation were reported. A small infestation near Greenwood Furnace, Pa., showed very light feeding in comparison with the defoliation in 1956. Little trouble is expected in 1958 from this pest.

Orange-Striped
Oak Worm

Small but severe defoliation of this well-known worm occurred throughout the region. It was reported in outbreak numbers in Franklin, Adams, Perry, and western Cumberland Counties, Pennsylvania. It caused moderate-to-heavy defoliation in central Connecticut and throughout Rhode Island. Thirty acres on an island in Lake George, New York, were sprayed by airplane with 2 gallons of a 9-percent DDT oil solution per acre. This infestation had been sprayed in 1956 with a 1-gallon-per-acre dosage of a 6-percent DDT solution.

Major Forest Diseases

A number of forest diseases are taken for granted and an all-too-complacent attitude is assumed regarding them. Year after year these diseases appear and receive very little attention. True, some are of no, or very little, economic importance. But others known to cause losses have been practically ignored, or are accepted as "normal"--it is generally thought that little can be done about them. Many foliage diseases would fall into the first category, although few of them have ever been adequately evaluated for the damage they cause. Among the diseases that extract their yearly toll of losses are the wood-rotting and stem-cankering diseases.

It is hoped that this yearly pest summary, as well as the Northeastern Forest Pest Reporter, will call attention to the prevalence of these forest pests. If it is realized how common and widespread some of the so-called "unimportant" diseases are, perhaps someone may be inspired to investigate their host relationships and evaluate the damage they do. Focusing attention on the stem-canker and wood-rotting dis-

eases may bring about a greater realization of their abundance, and management personnel may be persuaded to use the present pool of knowledge about these diseases in attempts to reduce their losses. They may apply sanitary measures promptly, and adapt cutting practices, proper rotations, and knowledge of stand compositions and densities that will reduce the losses caused by such diseases.

Throughout 1957, climatic factors had an important bearing upon the prevalance and course of disease development. Some diseases were suppressed while others were intensified. The influence of the drought and general weather conditions is strongly evident in this discussion of the major forest diseases in the Northeast.

Rusts

Early season indications were that 1957 would be a bad rust year. In many parts of New England continuous wet conditions during the critical first half of May favored development of early fruiting stages; but the long dry spell starting in mid-May suppressed the development of later stages. As a result, the early indications of a bad rust year never fully materialized. These general effects seemed to apply to the lesser as well as the better known and more important rusts.

Heavy aecial production of white pine blister rust (Cronartium ribicola) was reported from Maine and New York. Pennsylvania and Maine reported heavy Ribes infection with resulting defoliation. Approximately 400,000 acres of the New York control area were scheduled for examination during 1957, and 125,000 acres were estimated to be in need of Ribes eradication. The majority of areas in West Virginia were reported to be on a continuing Ribes suppression program. Massachusetts reported a delay in blister-rust-control activity because of lack of field personnel, but expected to increase the maintenance area, with special emphasis planned for the 1958 season.

Early evidence of needle rust (Coleosporium asterum = C. solidaginis) was widely reported. West Virginia, Vermont, and New York reported infections varying from light to heavy. Maine reported moderate infection of red pine in early June with its alternate host, goldenrod, moderately-to-heavily infected later in the season. Though generally of little importance, this rust was widespread throughout the Northeast.

The leaf rust of ash (Puccinia sparganioides - P. peridermiospora) showed early activity in the coastal regions of Maine, Massachusetts, and New Hampshire. But later on, the dry weather effectively reduced the ash-leaf phase,

so compared to previous years the presence of this rust on ash was very light.

Some of the miscellaneous, lesser-known rusts showed up prominently during the early part of the season and were unusually abundant. No reports were received concerning later stages of the following rusts on their respective alternate hosts. Rust of dwarf juniper (Gymnosporangium clavariaeforme) was very abundant on juniper in southern Maine and parts of New Hampshire. Massachusetts reported G. clavariaeforme on Juniperus communis; G. clavipes from the same host; and the cedar-apple rust (G. juniperi-virginianae) is causing more than usual attention over wide areas of the state. New infections of Vaccinium rust (Calyptospora goeppertiana) were unusually abundant in north-central Massachusetts during early May.

Diebacks And Wilts

Drought and hot, dry, mid-season weather conditions caused the dieback and wilt diseases (or disease complexes) to be unusually conspicuous in 1957. Reports of dead and dying trees were common during the latter part of the season. Patches of trees, either dead or dying, were noted on dry, rocky, exposed ridges or along roadsides where root disturbance by ditching had intensified exposure conditions, or where salt injury might have added its effects. Verticillium wilt was unusually common in Massachusetts, Vermont, New Hampshire, and Connecticut. Maine reported an increase of 110 percent in Dutch elm disease (Ceratocystis ulmi), about the same amount of Verticillium wilt, and a three-fold increase of Cephalosporium wilt (Dothiorella ulmi) over 1956. More dieback reports were received for 1957 than for previous years; dieback of roadside sugar maples was especially common throughout New England.

Special Survey Report No. 5, issued by the West Virginia Department of Agriculture (January 1, 1958), summarizes the oak wilt program for that state. No newly infected trees were found in 8 counties in which wilt had been found previously, and the total number of sites dropped appreciable. This trend was also cited for Virginia, Pennsylvania, and North Carolina. On the whole, the West Virginia report by Gillespie and Craig is encouraging, even though five new counties were added to those already known to contain the disease. In general, the indications were that the control procedures were working.

Oak dieback, which has been reported from New York, Pennsylvania, and West Virginia, apparently continues to be a problem. This dieback probably occurs elsewhere, but not to such an alarming degree.

Ash dieback has been noted from New York to Maine, and although its cause has not definitely been established, Cytophoma pruinosa has been found associated with the trouble and may be a contributing cause.

Foliage And Twig Diseases

The various anthracnoses were abundant during the early wet part of the 1957 season although later, hot, dry weather effectively suppressed late-season development of them. In Maine, ash anthracnose was abundant and oak anthracnose was common. Early season reports from Massachusetts included the following hosts: European purple beech, maples, linden, white oak, balsam fir, weeping willow, and Crataegus species. Pennsylvania reported anthracnose on red oak and sugar maple; Connecticut, on pin oak and sycamore. Vermont noted anthracnose as being light to moderate.

Among the miscellaneous foliage and twig diseases, the leaf blotch of horsechestnut (Guignardia aesculi) was less damaging than usual because its later stages were suppressed by drought conditions. Massachusetts reported Fusicoccum castaneum on twigs of Castanea mollissima; Vermont, a Taphrina sp. on sugar maple; and in spite of the drought, Massachusetts reported more elm leaf spot (Gnomonia ulmea) than in 1956. Drought apparently intensified symptoms of some foliage diseases such as the X-disease virus of wild cherry, and Taphrina cerasi of cherry was widespread and abundant. Maine disclosed a heavy localized infection of plum pocket (Taphrina pruni) on wild plum in Sherman, Me. Also in Maine, willow blight (Fusicladium saliciperdum and Physalospora miyabeana) caused light damage this year. Isolated cases of moderate damage occurred on weeping willow.

The Rots

Frequent reports of Fomes annosus root rot were received during 1957. The number and distribution of these reports reflect an increasing concern over this disease, although more people are becoming better acquainted with it and consequently more aware of it. New locations for Fomes annosus were reported from Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, and New York. Armillaria mellea root rot was found in Maine on elm, maple, white pine, and hemlock, while in Massachusetts it was noted on sugar and red maples, and oaks. West Virginia reported Poria obliqua from yellow birch growing at high elevation. Announcements from Massachusetts included: Fomes applanatus on sugar maple, with Cytospora and Steganosporium

sp. fruiting on dead twigs; Polyporus cinnabarinus on wild cherry; and, Polyporus tomentosus on red pine. Found growing on dead white birch on the Penobscot forest in Maine was Polyporus tsugae, a species rarely found on hardwoods but common on conifers--especially hemlock. Around Sherman, Me., there was considerable blowdown of white spruce and fir associated with infections of Polyporus Schweinitzii and Fomes pini. Polyporus schweinitzii was fruiting heavily in mixed stands of red spruce and dead larch in the vicinity of Waldoboro, Me.

A rot-and-cull study of red maple on the Penobscot Experimental Forest in Maine showed Polyporus glomeratus to be by far the leading cull producer, Fomes connatus second in importance and frequency, and Fomes igniarius third among the fungi commonly affecting living red maples. Internal rot produced by F. connatus is usually of limited extent, but that produced by the other two fungi is usually quite extensive. P. glomeratus frequently produces sterile conks on living red maples, but a thorough search for fertile conks only revealed two cases, both on dead and down maple bolts cut 5 to 6 years previously. Very extensive fruiting by a large variety of saprophytic and parasitic fungi occurred during the latter half of August in the Penobscot region, and provided some of the best collecting conditions ever experienced by the author. Here drought conditions were much less severe than farther south and, with mid-season rains followed by drier weather and favorable temperatures during mid-August, almost ideal conditions for fungal fruiting were produced. The variety of fungi found were too numerous to mention and the kinds of saporphytic Hydnums were outstanding.

Cankers

Nectria galligena was widespread and common, especially on aspen and black birch. Maine reported it as common on beech. The incidence of this canker species may be increasing. West Virginia reported a Nectria species as being heavy and destructive on black walnut. Beech bark disease (N. coccinea var. faginata) continues to be fairly heavy on the White Mountain National Forest where timber sales of beech are encouraged as a means of salvage. Cytospora canker (Cytospora kunzei) is common throughout the Northeast. It is causing continued mortality of white spruce in New York, though it appears less damaging on red spruce in New Hampshire, and improvement has been noted in Cytospora-infected stands of Norway spruce in Massachusetts. Also, during 1957, Massachusetts reported miscellaneous Cytospora species from willow, white spruce, sugar maple, and white pine.

Bleeding canker (Phytophthora cactorum) on maples, particularly sugar maple, has produced notable mortality in New Hampshire and Vermont in the last few years. It is apparently widespread and may be increasing in importance. It appeared to be more conspicuous during 1957, which may be related to the prevailing drought that seemingly intensified the variable symptoms of the sugar maple disease complex. Bleeding canker was reported from Connecticut, and it is undoubtedly much more common than reports indicate. New Hampshire also reported it from beech.

Miscellaneous cankers reported include Strumella coryneoidea occurring occasionally on oak in Maine. The virus pit canker of elm was reported around Waterville, Me., with general distribution noted elsewhere. This canker had previously been observed in southern New Hampshire. Black knot (Dibotryon morbosum) is widespread and frequent as twig cankers on wild cherry; while large trunk cankers were observed on black cherry throughout southern and eastern Maine and in north-central Massachusetts. It is believed that the incidence of large trunk cankers on the more valuable black cherry may be increasing and that more than one strain of this pathogen may exist. Rust cankers are associated with various rusts reported elsewhere. No reports are available comparing mortality in 1957 with previous years from rust cankers on young white pine, although during early season aecial development (before drought conditions prevailed) mortality was noticed in Maine and New York. Tympanis canker is reported as moderately active on red pine in New York.

Plantation And Nursery Diseases

Needle-cast diseases of Douglas-fir (Adelopus gaumanni and Rhabdocline pseudotsugae) fruited heavily in Vermont plantings, and Adelopus was observed in the majority of Douglas-fir sites planted in Connecticut. Unless controlled, these diseases may prove to be the limiting factor in the success of Christmas tree plantings of Douglas-fir in the East.

An inspection of a western New York nursery was requested to ascertain the cause of poor growth of Scotch pine. Unsuitable site and soil conditions were concluded to be the reasons for the trouble encountered at this nursery.

The New Haven Forest Disease Laboratory plans to initiate work projects on plantation and nursery diseases during 1958. Federal work on these problems, especially in the Northeast, has been neglected in the past; this new activity is designed to correct this deficiency. The Station wel-

comes notification of plantations and nurseries where trouble has been experienced.

Diseases Of Unknown Origin And Environmental Troubles

A freeze on May 17, 1957, caused widespread frost injury in southern Maine, New Hampshire, and Vermont. Affected species included ash, beech, oak, butternut, black locust, sugar maple, and shagbark hickory. New York reported late May frosts affecting oak, beech, and ash throughout most of the state. Pennsylvania recorded heavy frost damage during early May. West Virginia reported light-to-heavy statewide damage. From Massachusetts came word of frost injury and winter injury of Rhododendron, Crataegus, maple, lilac, oak, balsam fir, and beech. Winter burn of hemlock and red pine was light to moderate in Vermont. Maine reported winter drying responsible for top-kill of approximately 75 percent of 10,000 white pine seedlings in Newry.

Other non-parasitic troubles reported during 1957 included construction injury, scorch (widespread especially on maples), gas leaks, salt injury, rabbit damage, dieback from planting too deep, and miscellaneous diebacks. The effects of the 1957 drought are frequently mentioned throughout this report. For more specific details on the drought see the Northeastern Forest Pest Reporter 3 (October 1, 1957).

White pine needle blight .was observed in Maine, New Hampshire, New York, Massachusetts, and Connecticut, and reported as common in Pennsylvania. New Hampshire indicated less blight than in 1954, and that 1957 would not be considered a "bad blight year." This blight was considered rather heavy in two West Virginia counties. It will be interesting to note the possible consequences of the 1957 drought and the effects it may have on the incidence of white pine needle blight in 1958.

Birch dieback appears to be decreasing and some trees recovering (New Hampshire). The dearth of reports from other states indicates a general improvement in the birch dieback situation. Will the 1957 drought affect birch dieback in 1958? This should bear watching!

Oak dieback resulted in continued mortality of red oak in Pennsylvania. West Virginia expected additional losses and salvage operations were designed to reduce such losses. Several square miles, showing symptoms in 1956 for the first time, were reported dead in 1957. White oak appeared starting to succumb in several areas of West Virginia.

Resinosis, or pitch bleeding, of white pine is still a source of concern; the question of its cause, or causes,

largely goes unanswered. New York, Pennsylvania, and New Jersey reported this as a problem. Dying or dead larch and red pine were reported from Maine. The dying larch is mainly near the coast, with areas in the vicinity of Bangor; the red pine was near Redfield and Adams Mountain, where it appeared on shallow soils and rocky ledges. Extensive dying of sugar maple occurred throughout New England. Dead hemlock has been reported from Maine and New Hampshire. Dead tops and occasional mortality characterize a poplar decline in Maine. It was associated with leaf scorch, leaf miner, and borer galls, although no Hypoxylon canker was present.

Miscellaneous And Minor Troubles

Troubles reported but once, or of limited distribution or known minor importance, are listed below. Many of the trees reported as dead or having dieback resulted from a number of factors, either operating alone or in concert. Cases of dead and dying conifers, for example, seem to have resulted from drought-induced insect attack. Blue-stained wood in dead conifers was reported from Pennsylvania and New Jersey. Tip blight of pine (Diplodia pinea) was reported from Pennsylvania. Dwarf mistletoe (Arceuthobium pusillum) has caused heavy brooming with some mortality of white spruce in the Bristol area of Maine. Rather heavy spot infections of both red and white spruce occurred elsewhere.

Miscellaneous and rather common brooming rusts of balsam fir and other conifers, while fairly widespread, were not specified in 1957 reports, and apparently did little damage. Specimens of white spruce stem tumors were seen near Chelsea, Vt., and are also known to occur near Bar Harbor, Me. No pathogen has ever been found associated with these tumors (galls or burls); their cause has not been determined.

In addition to oak, birch, ash, and maple diebacks, dieback-disease complexes are found at times on practically all tree species. Beech dieback, for example, is common and deserves more attention that it has been given in the past. Scattered areas of balsam fir in which trees suddenly die, and the dead foliage turns a "fox or wine-red" color, occur commonly and are widespread. These stand out in sharp contrast to surrounding unaffected trees. Recently Canadian workers have found several weak parasitic fungi that seem to follow minor insect damage associated with this condition.

Table 1.--The forest insect situation in the Northeast, 1957

MAJOR FOREST INSECTS

Insect	Host	Locality affected	Extent	Degree of infestation	Recommended control action
Spruce budworm	Balsam fir; white, red, & black spruces	Maine (northern)	2,289,000 acres	Light-heavy	Spray 300,000 acres by airplane with DDT (1 lb.-1 gal./ acre).
Pine sawflies	All pines	Regionwide	Most species localized. Neodiprion pratti pratti 210,000 acres in Md. N. pratti paradoxicus extensive in N.J.	Light-heavy	Spray with DDT where feasible.
White-pine weevil	White pine, Norway spruce, & other conifers	Regionwide	General distribution	Light-heavy	Knapsack spraying of DDT, or lindane with extender, in small areas in early spring; helicopter spraying of DDT where feasible.
European pine shoot moth	Red, Scotch, & mugho pines	Regionwide, except northern New England and New York	General distribution	Light-heavy, most serious in Conn., N.Y., and Pa.	None as yet.

(continued)

Table 1.--(continued)

Insect	Host	Locality affected	Extent	Degree of infestation	Recommended control action
Nantucket pine tip moth	Loblolly, Virginia, & other pines	Massachusetts (Cape Cod), Connecticut, southeastern New York, New Jersey, Delaware, southeastern Pennsylvania, Maryland, W. Virginia	General distribution	Light-heavy, most serious in Delaware & Maryland.	None as yet.
Pine leaf aphid	White pine & red spruce (alternate hosts)	Northern New England, New York, & Pennsylvania	General distribution	Light-heavy, most serious in Maine.	Spray with contact insecticide where feasible.
Pine tortoise scale	Virginia pine	Pennsylvania (south-central), W. Virginia, & Maryland	Localized	Light-heavy, severe predation in some areas.	Spray where feasible with malathion for control of crawlers.
Balsam woolly aphid	Balsam fir	Maine, New Hampshire, Vermont, New York (Adirondacks).	General distribution	Light-heavy, sharp decline in northerly sections due to "deep freeze" of winter, 1956-57.	Sanitation-salvage cuttings where feasible; shortened rotation.
Red pine scale	Red pine, several ornamental pines	Connecticut (southeastern)	150+ sq. mi. around Bridgeport	Light-heavy, tree mortality continuing in spots.	Destroy infested trees.

		New York (southeastern, including Long Island)	Localized small infestations	Light-heavy	Destroy infested trees.
Pine engraver beetles (Ips)	Pines & other conifers	Regionwide	General distribution	Light-heavy, serious in Conn., N.Y., Pa., Md.	Avoid injury to residual trees in thinning and logging operations. Do not saw logs in proximity to residual stand. Remove infested and high-risk trees where feasible.
Pales weevil	Young conifers	Regionwide	Localized	Light-heavy	Do not replant for 2 years after cutting. Spray seedlings with lead arsenate or 2% aldrin emulsion. Dip tops in 1% BHC suspension before planting.
White pine cone beetle	White pine	Regionwide	General distribution	Light-heavy	None.
Pine needle miner	Pitch and shortleaf pine	New Jersey (south-central)	32,000 acres	Light-heavy	None.

(continued)

Table 1.--(continued)

Insect	Host	Locality affected	Extent	Degree of infestation	Recommended control action
Pine (and Saratoga) spittlebug	Pines	New York, Pennsylvania, W. Virginia, Delaware, New Jersey	Localized	Light-heavy, most serious in Christmas tree plantings in N.Y. and Pa.	Spray with DDT where feasible.
Gypsy moth	Hardwoods, white pine, & hemlock	New England, eastern New York, northern Pennsylvania, & New Jersey	General distribution	Light-heavy	Airplane spraying with DDT, Mist blower applications where feasible.
Fall cankerworm	Hardwoods	Maine (southeastern)	1,000 acres	Medium-heavy	Airplane spraying with DDT.
		Maryland	1,000+ acres	Heavy	Roadside spraying with DDT in recreational areas.
		Massachusetts, northern New Jersey, Pennsylvania, W. Virginia	General distribution	Light	None.
Maple leaf cutter	Sugar maple	New York, Vermont, northwestern Massachusetts	Localized	Light-heavy, sharp decline in Vt.	None.
Variable oak leaf caterpillar	Oaks	Southern New Jersey, Delaware, eastern Maryland	General distribution	Light-medium, decreasing	None.

Orange-striped oak worm	Oaks, other hardwoods	Regionwide	Localized	Light-heavy, most serious in Pa., Conn., and R.I.	Spray with DDT where feasible.
Saddled prominent	Hardwoods	Maine (central)	Localized	Very light, marked decrease from 1956.	None.
		New York (Rensselaer Co.), Massachusetts (Berkshire Co.), New Hampshire (Merrimack Co.)	Localized	Very light, marked decrease from 1956.	Spot spraying with DDT in Berkshire County.
Forest tent caterpillar	Aspen, sugar maple, & other hardwoods	New England, New York	Localized	Very light, outbreak sub-sided	None.
		West Virginia	Localized	Light-heavy	Spray with DDT where feasible.
Beech scale	Beech	Maine, New Hamp-shire, Vermont, eastern New York	General distribution	Light-heavy	Sanitation-salvage cutting where pos-sible.
Sugar maple borer	Sugar maple	Northern New England, New York	General distribution	Light-heavy	None.

(continued)

Table 1.--(continued)

MINOR FOREST INSECTS

Insect	Host	Locality affected	Extent	Degree of infestation	Recommended control action
Bagworm	Red cedar, black locust, other conifers & hardwoods	New Jersey, Delaware, Maryland, W. Virginia, southern Pennsylvania	General distribution	Light-heavy, most severe in Del. & Md.	Spray with lead arsenate or toxaphene where feasible.
Balsam needle gall midge	Balsam fir	Maine (northeastern)	General distribution	Heavy	None.
Pine chafer	Virginia pine	Pennsylvania, Maryland, W. Virginia	Localized	Light-heavy	None.
Blackheaded budworm	Balsam fir & spruces	Maine (northern)	General distribution	Light-medium	None.
	Hemlock	W. Virginia	Localized	Light	None.
Pine needle scale	Pines	Regionwide	General distribution	Light-heavy	Spray ornamentals & Christmas trees with contact insecticide.
White triangle leaf roller	Balsam fir	Maine (northern)	General distribution	Light-medium	None.
Pine tip moth	Scotch pine	Pennsylvania	Localized	Light-heavy	None.

White pine aphid	White pine	Regionwide	General distribution	Light-heavy	None.
Pine twig borer	Scotch pine	Pennsylvania, New York	Localized	Light	None.
Pine tip aphid	White pine & red spruce (alternate hosts)	Vermont, New York	General distribution	Light-heavy	None.
White spruce tip moth	White spruce, other spruces, balsam fir	Maine	General distribution	Light-heavy, most severe in Maine coastal areas	None.
Larch casebearer	Larch	Pennsylvania (southern)	Localized	Light-medium	None.
Yellow-headed spruce sawfly	Spruces	Maine, New York	Localized	Light	None.
Balsam fir sawfly	Balsam fir	Maine	General distribution	Light	None
Locust leaf miner	Black locust	Regionwide	General distribution	Light-heavy	Spray with DDT where feasible.
Fall webworm	Hardwoods	Regionwide	General distribution	Light	Spray with DDT where feasible.

(continued)

Table 1.--(continued)

Insect	Host	Locality affected	Extent	Degree of infestation	Recommended control action
Periodical cicada	Hardwoods	Pennsylvania, Maryland, West Virginia	General distribution	Light-heavy	None.
Satin moth	Hardwoods	Maine, New York	Localized	Light-heavy	Spray with DDT where feasible.
Locust borer	Black locust	West Virginia	Localized	Light-heavy	None.
Oak leaf miner	Oaks	Eastern Massachusetts, Rhode Island, W. Virginia	General distribution	Light-medium	None.
Beech leaf tier	Beech	Delaware (northern)	Localized	Medium	None.
Oak leaf skeletonizer	Oaks	Massachusetts (eastern)	General distribution	Light-medium	None.
Poplar leaf-folding sawfly	Aspen	New York (Essex Co.)	500 acres	Medium	None.
Walnut caterpillar	Black walnut	New York, Delaware	Localized	Light-heavy	Spray with DDT where feasible.
Mimosa webworm	Honey locust, mimosa	Pennsylvania, Maryland, Delaware, W. Virginia	Localized	Light-heavy	Spray with DDT where feasible, or with lindane.

Table 2.--The forest disease situation in the Northeast, 1957

Disease	Host	Locality affected[1/]	Extent[2/]	Degree of infection or injury[2/]	Recommended control action
Blister rust	White pine	Maine (southern)	General	Heavy on Ribes	Ribes eradication.
		Pennsylvania	--	--	Ribes eradication.
		Massachusetts	General	Maintenance area increasing.	Ribes eradication.
		New York	General	Increasing, 125,000 acres need eradication.	Ribes eradication
		West Virginia	General	Majority areas on maintenance.	Ribes eradication.

[1/] Reports of localities are often poorly specified. They are based on the best information available.

[2/] Frequently inferred, when specific information was not available; often based on insufficient information and limited number of reports.

(continued)

Table 2.--(continued)

Disease	Host	Locality[1/] affected	Extent[2/]	Degree of infection or[2/] injury	Recommended control action
Needle rust	Red pine	New York (statewide)	General	Heavy	None.
		West Virginia	Scattered	Light	None.
		Vermont	Scattered	Moderate-increasing	None.
Leaf rust	Ash	Maine, New Hampshire, Massachusetts	Limited to coastal areas	Very light	None.
Juniper rust	Dwarf juniper	Maine (eastern)	General -- juniper areas	Very abundant	None.
Cedar-apple rust	Juniper	Massachusetts	Widespread	Light-heavy	None for juniper.
Quince rust	Juniper	Massachusetts (Monson & Whately)	--	Negligible	None.
Southern fusiform rust	Loblolly pine	New Jersey (Lebanon State Park)	Localized	Light	None.
Witches' broom	Vaccinium	Massachusetts (north-central)	General	Heavy	None.

Beech scale-Nectria	Beech	Throughout Northeast	Localized	Light-heavy	Sanitation and salvage cuttings.
Dutch elm disease	Elm	Regionwide	General	Variable - increasing	Spray for insect carrier; eradicate trees promptly.
Verticillium wilt	Maples, elms	Regionwide	General	Moderate-heavy, more than previous years.	None.
Cephalosporium wilt	Elms	Regionwide	Scattered	Light	None.
Sugar maple dieback	Sugar maple	Vermont, New Hampshire, Maine, New York, Connecticut, & Pennsylvania	General	Serious for Vermont & New Hampshire. Increase in 1957.	Salvage where feasible.
Oak wilt	Oak	Pennsylvania (south-central)	Localized -- scattered	Moderate	Poisoning trees within 50-foot radius; deep girdling.
		Maryland (western)	General	Light(?)	
		West Virginia	General	Heavy (eastern and southern); light-moderate elsewhere; downward trend in 1957.	Deep girdle recommended.

(continued)

Table 2.--(continued)

Disease	Host	Locality affected [1/]	Extent [2/]	Degree of infection or injury [2/]	Recommended control action
Oak dieback	Red and scarlet oak	New York (Cattaraugus Co.)	Localized(?)	Light	Salvage where feasible.
		Pennsylvania (south- and north-central)	General	Light-moderate	Salvage where feasible.
		West Virginia (eastern)	Scattered along ridges	Several sq.mi. where trees have died; white oaks succumbing in W.Va.	Salvage to reduce losses.
Birch dieback	White and yellow birch	Maine, New Hampshire, New York (Adirondacks)	General	Light; decrease and recovery in New Hampshire.	Salvage to reduce loss; light harvests desirable.
Ash dieback	Mainly white ash	Maine (northeastern), New York	May be general throughout Northeast.	Light	None.
Anthracnose diseases	Ash, oak, sycamore, maple, beech, & other hardwoods	Throughout Northeast	Scattered	Slight, lighter than usual.	Spray for ornamentals, none otherwise.
Leaf blotch	Horsechestnut	Throughout Northeast (coastal areas)	Scattered	Slight, lighter than usual.	Spray with Bordeaux or organic mercuries for ornamentals.

Elm leaf spot	Elm	Massachusetts	Localized	Light-heavy	Spray with organic mercuries for ornamentals.
Pit canker (Virus)	Elm	New Hampshire (southern) Maine (Waterville vicinity)	Scattered Occasional trees	Slight Individual trees may be heavily cankered.	None.
X-disease (Virus)	Cherry	Throughout Northeast	General	Heavier than usual.	None.
Willow blight & willow scab	Willow	Maine	Localized	Light, less than usual.	None.
Plum pocket	Wild plum	Maine (Sherman vicinity)	Localized	Heavy	None.
Witches' broom	Cherry	Throughout Northeast	General -- scattered	Light	None.
Needle cast	Douglas-fir	Vermont, Connecticut	Scattered	Light-heavy	Spray control desirable for Christmas trees.
Fomes root rot	Red pine, white pine & spruce	Throughout Northeast	Scattered and localized	Light-medium; increasing in importance.	None, as yet.
Shoestring root rot	Hardwoods & conifers	Throughout Northeast	General	Light	None.

(continued)

Table 2.--(continued)

Disease	Host	Locality affected [1/]	Extent [2/]	Degree of infection or injury [2/]	Recommended control action
Trunk rots	Red maple	Throughout Northeast; Maine (Penobscot), New York (Adirondacks)	General	Heavy; about 70% trees contained rot. Cull not determinded in Maine; in N.Y., cull 40-50%.	None, as yet.
Nectria canker	Poplars, birch, beech, & maple	Throughout Northeast	General	Light-heavy; poplars & black birch most severely damaged.	Stand improvement cuttings.
Cytospora canker	Norway & red spruce	New York	General	Light; some mortality on Norway spruce	Good sites, proper thinning, and sanitation cuts.
		New Hampshire	General	Light; red spruce improvement	
		Massachusetts (north-central)	General	Light; general improvement	
Bleeding canker	Maple, beech	Vermont, New Hampshire, Connecticut	General	Heavy on maple in Vt. & N.H.; light on beech in N.H.; increase in Conn.	None.

Strumella canker	Oak	Maine (Lisbon Falls vicinity)	Localized	Light	None.
Black knot	Cherry	Throughout Northeast	General	Abundant infection; damage light	None.
	Black cherry	Maine & Massachusetts	Localized	Damage moderate	Improvement cutting for trunk cankers.
Tympanis canker	Red pine	New York	General	Light	Thinning planted stands.
Tip blight	Austrian pine	Pennsylvania	Localized	Light(?)	Pruning and Bordeaux spray for ornamentals.
Dwarf mistletoe	White, red, & black spruce	Maine (Bristol vicinity & Penobscot Forest)	Localized	Medium	None.
White-pine needle blight	White pine	Throughout Northeast	General	Light	None.
Resinosis, pitch bleeding	White and red pine	Regionwide (Maine, New York, and Pennsylvania)	Scattered	Light	None.
Deterioration	White pine	Maine (Wiscasset area)	Localized	Light-medium	None.

(continued)

Table 2.--(continued)

Disease	Host	Locality affected[1/]	Extent[2/]	Degree of infection or injury[2/]	Recommended control action
Dead and dying trees	Balsam fir	Regionwide	Scattered	Light	None.
	Larch	Maine (coastal-Wiscasset & Bangor vicinity)	Scattered	Light-medium	None.
	Sugar maple	Throughout Northeast	General	Medium-heavy	None.
Drought damage, Scorch	Hardwoods & conifers	Coastal region (Maine to Maryland)	General -- scattered	Light-moderate (exposed sites)	None.
Frost damage	Hardwoods	Maine (south & central); New Hampshire (southern & mountains), Vermont (southern), New York, Pennsylvania (north-central), Massachusetts and West Virginia (statewide)	General; mostly moderate and scattered pockets.	Light-moderate	None.
Winter injury	Ornamentals	Massachusetts	Scattered	Light	None.
Winter drying	White pine	Maine (Newry vicinity)	Localized	Moderate	None.

Poplar decline	Poplar	Maine (Portage vicinity)	Localized	Light	None.
Tumors (Galls or Burls)	White spruce	Maine (coast near Bar Harbor); Vermont (near Chelsea)	Localized	Light	None.
Blue stain	Red pine	Pennsylvania, New Jersey	Localized	Light	None.

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